

# A Case Report with Literature Review of Managing a Foreign Object in the Root Canal of the Permanent Tooth

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## ABSTRACT

Young children are more explorative with all the objects they encounter and they develop the habit of inserting them into their mouth. In some cases, the object can injure the child's oral cavity. And it could be associated with self-injurious behavior of the child. Hence, a proper diagnosis of it is important. There are several reports on various foreign objects embedded in the root canal, which acts as a constant source of pain and infection in the oral cavity. The case report describes a 14-year-old boy with a foreign object in his maxillary left first premolar and the conservative management of the same. The boy was diagnosed to have no such self-injurious/deliberate self-harm behavior from the detailed history taken. The paper reviews the various management strategies for the removal of foreign objects from the root canal.

**Keywords:** Foreign object, Root canal, Self-injurious behavior.

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## INTRODUCTION

Insertion of foreign objects in the root canal is a common clinical problem especially among children. Some children do it as a habit whereas in others it is associated with self-injurious behavior. Children explore their fractured teeth by use of various objects like staple pins, tooth picks or any sharp objects like pencil leads, sewing needles, wooden tooth picks, plastic chopsticks, finger nail, etc. Children do this when they concentrate on watching TV and while studying. These objects when they embed in the root canal can act as a source of infection and may lead to pain, swelling, and fracture of the tooth.<sup>1</sup>

The discovery of foreign objects in the root canal is rare sometimes and requires various diagnostic aids to find the composition and location of the object.<sup>2</sup> This case report describes the presence of a foreign object in the root canal and its conservative management, along with the review on various management strategies for the removal of foreign objects from the tooth.

## CASE DESCRIPTION

A 14-year-old boy was brought to the Department of Pediatric and Preventive Dentistry, KLE VK Institute of Dental Sciences, with a chief complaint of pain in the left upper back tooth region since 2 months. The patient gave a history of continuous, nonradiating pain since 1 week associated with the same region. On clinical examination, there was a deep and open carious lesion in 24 (Fig. 1), dental caries with 36, 47, attrited 46. The patient maintained a poor oral hygiene due to pain. Radiographic examination of the painful tooth revealed a radiopaque foreign object in the root canal of 26 (Fig. 2). On detailed history, it was found that the patient had a habit of biting pins and other sharp objects that he encounters. Direct examination of the foreign body confirmed that it was a staple pin (Fig. 3). The pin was removed using a probe (Figs 4 and 5) as it was visible and easily accessible, following which thorough irrigation of the canal with povidone iodine and saline was carried out. The patient was recalled for root canal treatment with 24. The working length was estimated and the canals were then obturated using the gutta percha and the AH plus sealer (Fig. 6).

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## DISCUSSION

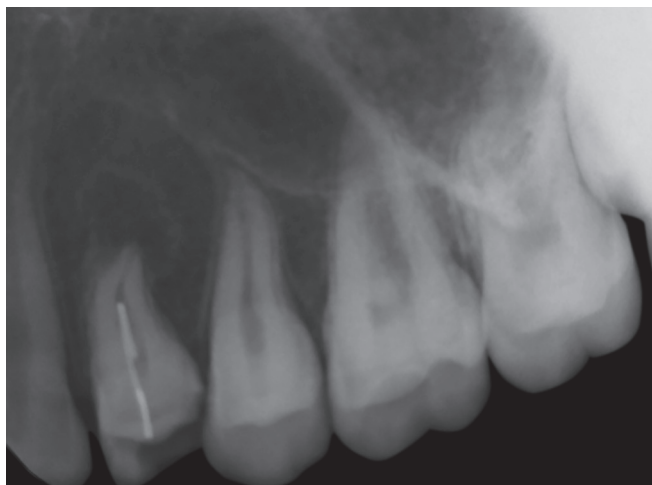
Root canal procedures are sometimes complicated by the blockages in root canals. Blockages can be due to broken dental instruments during the procedure and sometimes by foreign objects that are inserted by the patients themselves. The teeth involved may be associated with pain and infection. Mostly these foreign objects in root canals are detected accidentally on preoperative diagnostic radiographs.<sup>3</sup> Otherwise, they go unnoticed.

Various radiographic methods have been suggested to localize a radiopaque foreign object. They are vertex occlusal views, parallax views, stereo radiography, triangulation techniques, and tomography.<sup>3</sup> These specialized radiographic techniques play a vital role to localize the foreign objects inside the root canal.<sup>2</sup>

These techniques are of significance if the object is radiopaque. Whereas in case of a radiolucent object, authors recommend to take a proper case history regarding the oral habits and other



**Fig. 1:** Preoperative intraoral clinical view of the carious premolar tooth (24)



**Fig. 2:** Preoperative intraoral periapical radiographic view of 24



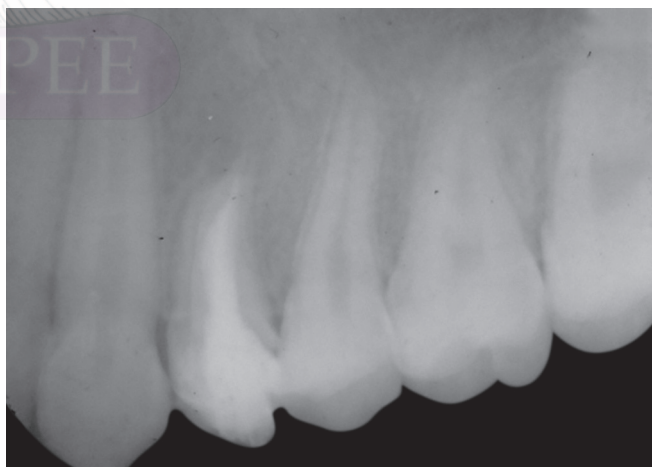
**Fig. 3:** Clinically visible foreign object in the premolar tooth



**Fig. 4:** Retrieval of the foreign object from the root canal



**Fig. 5:** Retrieved staple pin



**Fig. 6:** Obtured and healed premolar (24)

self-injurious behavior of the patient and careful instrumentation to prevent pushing the object more apically.<sup>4</sup> Careful exploration of the root canal is important because there are reports of migration of teeth or implants into the maxillary sinus and migration of the gutta percha into the ethmoid sinus.<sup>5</sup>

Various foreign objects are inserted into the root canal. Cases on the presence of fingernails and their retrieval from the root canal are reported.<sup>4</sup> Unusual objects like hat pins and dressmaker pins were retrieved from the root canal by Zillich and Prickens<sup>6</sup> and Turner.<sup>7</sup> Presence of a glass bead within the pulp chamber was reported



by Nagaveni and Umashankara.<sup>8</sup> Bunch of incense sticks,<sup>9</sup> piece of ornament,<sup>10</sup> minute hand of a watch and pencil lead,<sup>11</sup> and paper clip<sup>12</sup> have been retrieved from the root canal.

Apart from the insertion by the patients themselves, sometimes accidental insertion into the canal also happens when the canal is left for an open drainage by the dentist. An open drainage may place the patient at risk of foreign body lodgment in the root canal.<sup>13</sup> Grossman reported retrieval of tomato seed, pencil tips, brads, absorbent points, toothpick, and even tomato seed from the anterior tooth root canal when it is left open for drainage.<sup>14</sup> To overcome this, Weine<sup>15</sup> suggested that the patient remains in the dental office with the draining tooth for an hour or more and get his access cavity sealed before leaving the office.

Various techniques are reported in the literature for the removal of the foreign objects from the root canal depending on the position and composition of the object. The procedure becomes difficult and tedious if the foreign body is unusual.<sup>16</sup>

Stieglitz forceps have been recommended for the removal of silver points from the root canal.<sup>17</sup> The Masseran kit<sup>18</sup> and modified Castroviejo needle holders<sup>19</sup> have been used for the removal of fractured posts and broken endodontic instruments, respectively. The file braiding or multiple file technique described by Glick can be used for foreign object retrieval from the root canal. It consists of insertion of multiple H files into the canal and twisting them around the foreign body. H files are preferred due to their flute design to engage the foreign body and to exert a gripping force. This technique has been employed along with the use of Stieglitz forceps by Grover et al.<sup>20</sup> for the removal of the intraradicular metallic object from lower left lateral incisors. Researchers have demonstrated the use of a simple aid consisting of a disposable dental needle of 25 gauge, a segment of a thin steel wire, and a small mosquito hemostat for the removal of foreign objects from the root canal.<sup>21</sup> Costa et al. reported a case where endoscopically assisted procedure was used for the removal of the foreign body from the root canal, which was diagnosed to be a residual endodontic cement.<sup>5</sup> Chaturvedi et al. reported a case with the presence of a staple pin in the root canal that extruded 2–3 mm through the apex for which apicoectomy was performed to remove the pin.<sup>1</sup> A tweezer was also used for the removal of a fractured needle from the palatal root canal of the maxillary first molar.<sup>22</sup> Stainless steel files along with EDTA were also used for the removal of a foreign object from the root canal.<sup>3</sup> Walveker et al. utilized a technique wherein two H files were used to engage and remove the foreign object.<sup>23</sup>

Custom-made hooks made of 0.3, 0.4, 0.5, and 0.6 mm of stainless steel wire were used by researchers for the foreign body removal from the root canal, though it may not be applicable in all types of foreign body.<sup>16</sup> Use of an operational microscope and ultrasonics was advocated by Nehme for the extirpation of intracanal metallic obstruction.<sup>24</sup> A similar technique of use of the Cavi-Endo ultrasonic instrument was used successfully by Meidinger and Kabes for the removal of a broken bur tip and amalgam particles from the root canal.<sup>25</sup> McCulloch suggested the removal of small amount of tooth structure to get the stucked foreign object free.<sup>26</sup> The same was described by Fros and Berg<sup>19</sup> who advocated the removal of the internal tooth structure before the object is removed from the root canal.

Various other methods used are the microtube removal system like lasso and anchor, tube and glue, tap and thread, and the endo-extractor instrument removal system.<sup>27</sup>

In the present case, a staple pin was used as a toothpick by the patient to clean the food lodged in the open carious tooth.

Also the patient developed the habit of holding the pin between the upper and the lower teeth. Many consequences occur due to sharp objects, such as laceration of the oral mucosa, pushing of the object into the maxillary sinus, and ingestion and movement into the pharynx. The foreign body is ingested accidentally many times when it is used to insert into the open carious tooth and is a common clinical problem especially in children. Foreign body aspiration is still more life-threatening than the foreign body ingestion. Bronchoscopy either flexible or rigid is the treatment of choice for the removal of an aspirated foreign body.<sup>28–30</sup> Hence, the parents are to be educated regarding the oral habits and practices of their child.

Other consequences like actinomycosis following placement of a piece of jewelry chain into the maxillary central incisor have been reported by Goldstein et al.<sup>31</sup> Sometimes, these habits are associated with self-injurious behavior in a pediatric patient.<sup>32</sup> In such cases, detailed case history is required to know the behavior pattern, following which counseling to both the patient and the parent has to be done.

## CONCLUSION

A pediatric dentist encounters various oral habits in children. Though retrieval of the foreign object from the root canal is a tedious, bizarre situation and challenging to a pediatric dentist, with proper history, radiographic techniques, skill, and perseverance, the object can be safely removed to ensure proper cleaning of the root canal. Also education and warning have to be given to the parents against such activities of their children.

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